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## PROBLEMS FOR SOLUTION.

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### ALGEBRA.

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298. Proposed by W. J. GREENSTREET, Marling School, Stroud, England.

Find an approximation to the difference between the sums of  $n$  harmonic and  $n$  arithmetic means between  $a$  and  $b$ , when  $a$  is very nearly equal to  $b$ .

299. Proposed by C. N. SCHMALL, 89 Columbia Street, New York City.

The sides of a triangle and the area are in arithmetical progression. Find their values, and show there is only one solution in rational integers.

### GEOMETRY.

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331. Proposed by C. N. SCHMALL, 89 Columbia Street, New York City.

The center of two spheres radii  $r_1, r_2$ , are at the extremities of a straight line  $2a$  on which as a diameter a circle is described. Find a point on the circumference from which the greatest portion of spherical surface is visible.

### CALCULUS.

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255. Proposed by G. B. M. ZERR, A. M., Ph. D., 4243 Girard Avenue, Philadelphia, Pa.

Find the general values of  $u$  and  $v$  in terms of  $x$ , which satisfy the equations  $u^2 + l^2(du/dx)^2 = v^2$ ,  $u^2 + m^2(du/dx)^2 = v^2 + n^2(dv/dx)^2$

256. Proposed by S. A. COREY, Hiteman, Iowa.

Prove that  $\sum_{x=0}^{x=\infty} \frac{x^m}{1+x^n} = \frac{\pi}{2n \sin \frac{2m+1}{2n}\pi}$ ,  $m$  and  $n$  being positive integers

of which  $n$  is the greater.

257. Proposed by G. B. M. ZERR, A. M., Ph. D., 4243 Girard Avenue, Philadelphia, Pa.

If  $A = \int_0^{\infty} \frac{dx}{\sqrt{x}(2a+x)^n}$ ,  $B = \int_0^{\infty} \frac{y^n dy}{\sqrt{y}(a^2+y^2)^n}$ , find  $A/B$ .

### MECHANICS.

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215. Proposed by R. D. CARMICHAEL, Anniston, Ala.

Determine the curve in a vertical plane along a chord of which a particle will slide under the force of gravity and the retardation of friction so that it will traverse the whole length of the chord in a time  $t$  which is independent of its direction as long as the upper end of the chord remains fixed. Discuss the result.